

SHORT DESIGN CASES

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Prepared in the Design Division of the Department of Mechanical Engineering
by J. Kendall Williams under the direction of Robert H. McKim, with
financial support by the National Science Foundation.

SHORT DESIGN CASES (A)

Patient Room Door Handles

Door handles on patient room doors at the Stanford-Palo Alto Hospital Center were designed so that a nurse carrying a tray with both hands still could open or close these doors.

A typical entry situation at the Stanford Palo Alto Hospital Center is described in Exhibit A-1, figures 1 and 2. Entering a patient's room from a ward hallway posed little problem because the door could be pushed open with a wedging action of the foot as shown in figure 1. Heavy hallway traffic required that these doors swing only into the room. Although the door was not equipped with a closing device, a damping device slightly restricted the rate at which the door could be opened or closed and held the door in an open position against a light breeze through the patient's room.

Nurses at the hospital complained that leaving a patient's room with a heavy tray when the door was closed was difficult, requiring the nurse to back the door open with the tail of the door handle over her forearm as shown in Exhibit A-1, figure 2. The motions required to open the door made it especially difficult to support a heavy tray.

The door handles are described in greater detail in Exhibit A-2. The Model 1134 handle with matte chrome finish cost \$5.80 each.

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Exhibit A-1. Patient Room Door.



Figure 1. Nurse shown entering patient room from ward hallway.



Figure 2. Nurse shown opening door from inside patient room.

DOOR PULLS

Extruded Brass, Bronze, Aluminum

ECL 24
ME 112b-1

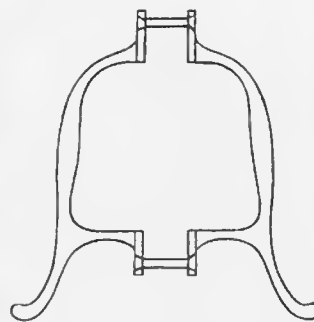

1130



1131


1133
1133L


1134



1134B



1137

TRIMCO NUMBER	GRIP STOCK SIZE	CTC	BASE SIZE	CLEARANCE	O/A PROJ.	O/A LENGTH	MISCEL & FASTENERS	PACKED IN BOX	WT. LBS. PER BOX ALUM
1130	—	6 5/8	2 x 3	1 5/8	2 1/8	9 5/8	TB-WS-MS	1	.75
1131	—	6 5/8	2 x 3	1 5/8	2 1/8	9 5/8	TB-WS-MS	1	1.0
1133	Govt. No. 458	2 3/8 x 1 1/8	1 5/8 x 3	3 3/8	3 3/4	6	WS-MS-TB	2	.75
1133L	—	1 1/8	1 5/8 x 3	3 3/8	3 3/4	6	TB w/lugs	2	.75
1134	Govt. No. 458A	6 x 3/4	1 1/8 x 1 1/8	2	3 5/8	9 1/8	WS-MS-TB	2	.7
1134B	—	—	1 1/8 x 1 1/8	2	3 5/8	9 1/8	BTB	1 pr.	1.4
1137	3/8 x 1 1/4	8	1 3/4 x 10	1 7/8	2 1/4	10 1/4	TB-WS-MS	1	2.
1139	3/8 x 1 1/4	6	2 1/4 x 1 3/4	1 7/8	2 1/4	8 1/4	TB-WS-MS	1	1.5
1140	3/8 x 1 1/4	8	3/4	1 7/8	2 1/8	14 1/4	TB	1	1.
1141	3/8 x 1 1/4	8	3/4	1 7/8	2 1/8	14	TB	1	.8
1142TB	1" OD	12	1 3/4 x 1/2	1 3/8	2 1/2	12 1/2	TB	1	.5
1142BWS	1" OD	—	2 1/2 x 2 1/2	1 3/4	2 7/8	15	WS-MS	1	.75
1142BTB	1" OD	12	2 1/2 x 2 1/2	1 3/4	2 7/8	15	TB	1	.75

Fasteners listed first are supplied as stock. Specify otherwise. Lucite grips may be supplied in lieu of round metal grips. On quotation—specify. All items this page except numbers 1130, 1131, 1133, 1134 may be extended as to length and/or CTC also may be extended—specify on quotation. Sizes listed first in CTC column are supplied as stock. Submit samples or drawings of designs or types of pulls not shown—on quotation. Triple aluminum weight for brass and bronze. (Approx)



1139



1140



1141



1142TB



1142BWS



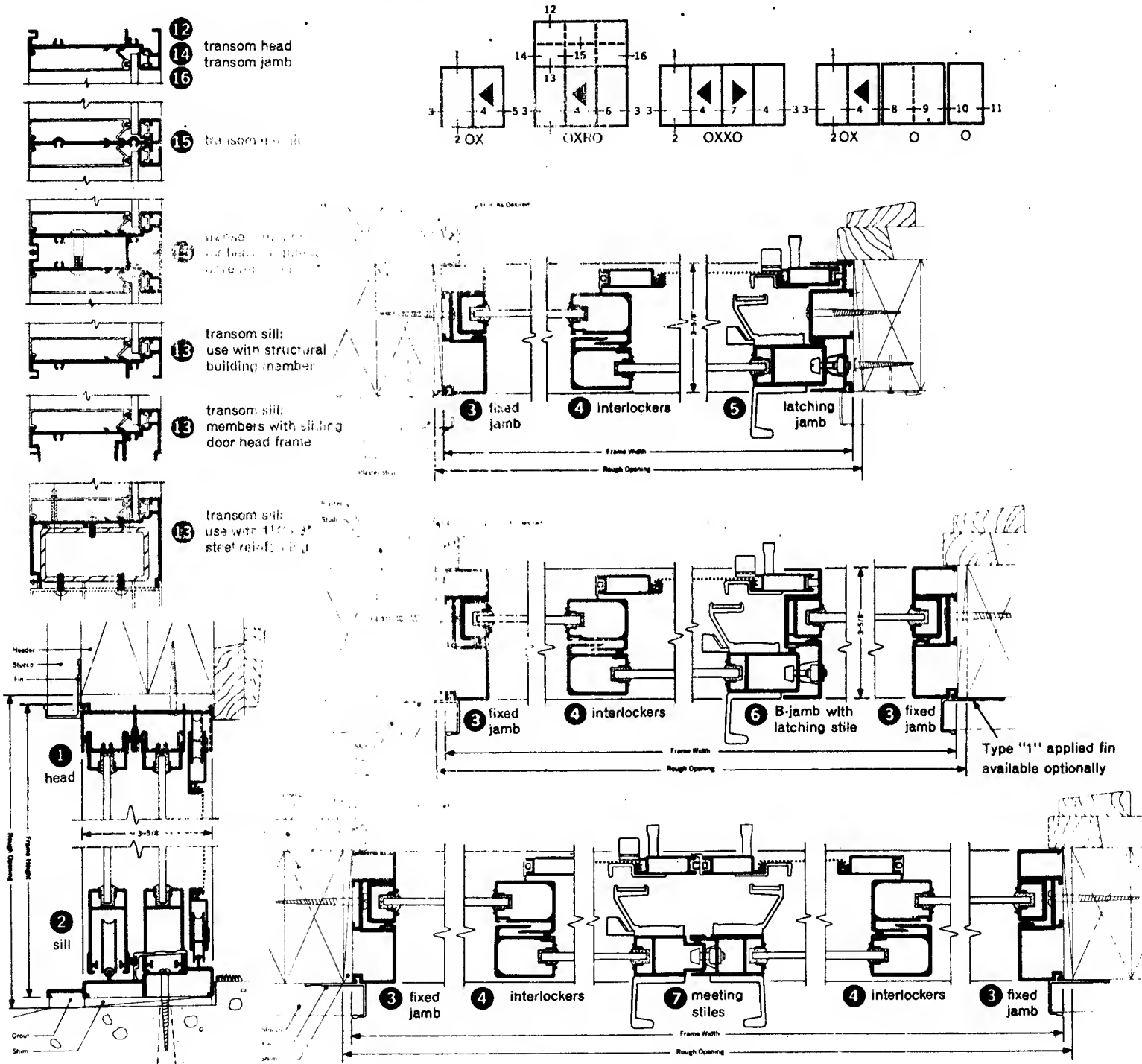
1142BTR

SHORT DESIGN CASES (B)
Opening Sliding Glass Doors

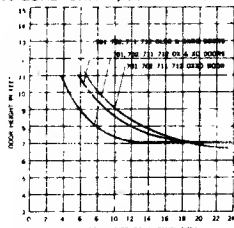
Sliding glass doors intended for home installation were generally opened and closed manually. Such doors were easy to operate with one hand. However, when the user carried a load which required both hands, opening the sliding doors was a problem. Mrs. Hartley Anderson, a housewife from Palo Alto, California, commented to an interviewer, "I frequently have had to put down a tray of food that I was carrying out to our patio, open the patio sliding door, pick up the tray from the dining room table, put it down outside, and then close the door. It certainly would be convenient not to have to go through so many operations."

The majority of manufacturers of sliding glass doors used aluminum extensions for upper and lower sills and door frames. Details of hardware made by Northrup Architectural Systems, Inc., in its "Arcadia Series 700" sliding doors are described in Exhibit B-1. Installation details for various types of house construction are described in Exhibit B-2.

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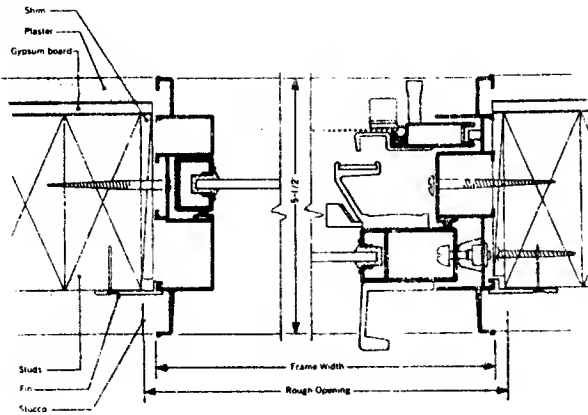
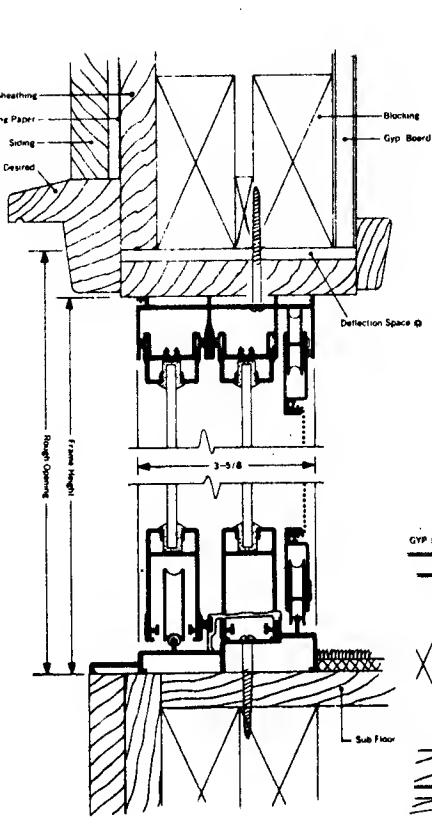
ARCADIA 35" SERIES 700 SLIDING DOORS

WIND-LOAD CHART, SERIES 700 DOORS

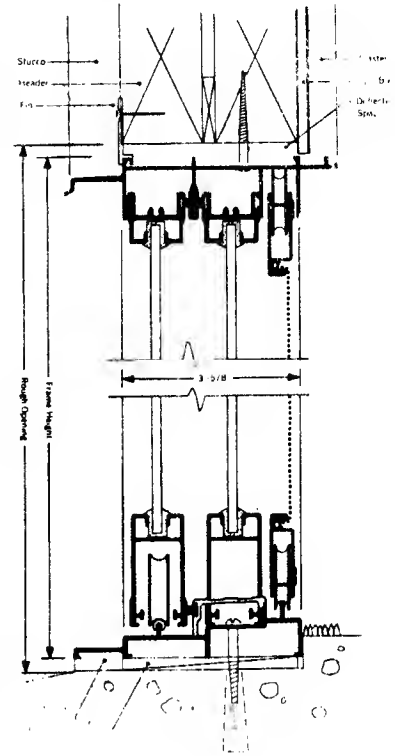


Wind = 15 psf Alloy = 6063-T5 Stress = 10,000 x 4/3 13,300 psi
 For 20 psf multiply H x .865 For 30 psf multiply H x .700

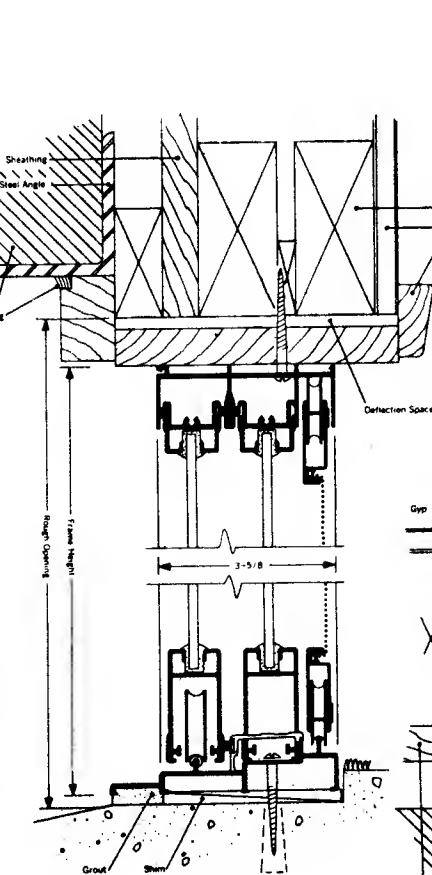
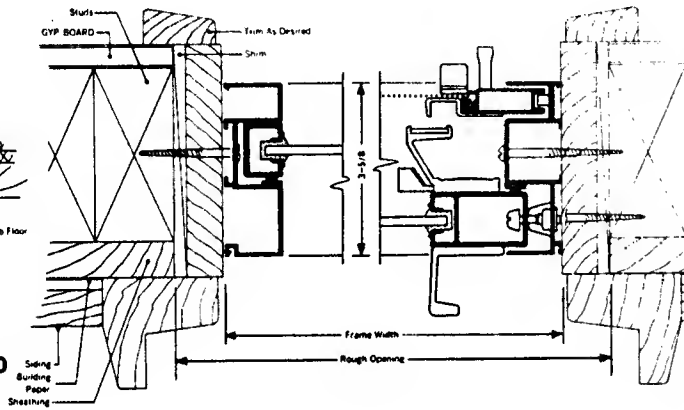
TYPICAL INSTALLATION DETAILS



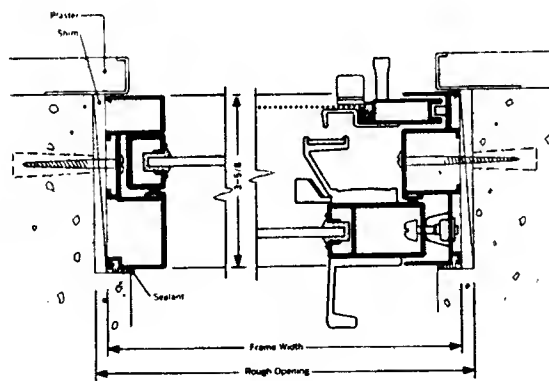
FRAME AND STUCCO / SERIES 700



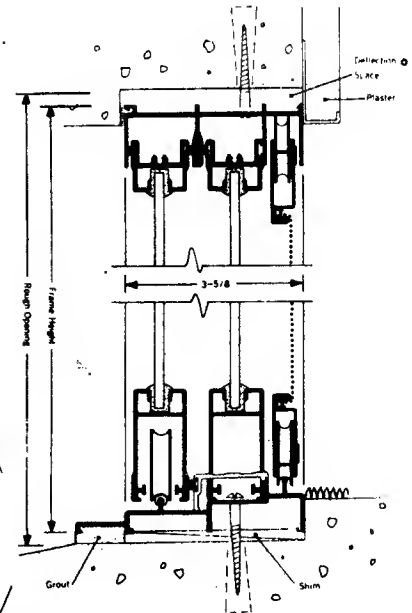
FRAME AND SIDING / SERIES 700



BRICK VENEER / SERIES 700



CONCRETE / SERIES 700



* Note for concrete:
Deflection space at head should be 1/2\"/>

SHORT DESIGN CASES (C)

Surgical Instrument Cabinet Doors

In August, 1964, Frank Vitale, Chief Engineer for the Stanford-Palo Alto Hospital Center, was confronted with the problem of repairing several surgical instrument cabinet doors which had "jumped" their tracks. He said, "Most of our work deals with corrective measures applied to existing equipment. One of our biggest headaches has been the sliding doors on the instrument cabinets used to store surgical equipment. The doors keep falling off their tracks. We have received several reports of nurses being injured by the falling doors. In the latest accident, one door fell on a nurses toe during an operation. She had to be taken to Emergency for an x-ray." The surgical cabinet doors are described in greater detail in Exhibit C-1, figures 1 and 2.

Mr. Vitale reported that hospital engineers had tried several remedies to keep the doors from jumping their tracks. The cabinet manufacturer suggested using nylon guide pins at the top of the door to decrease the clearance between the door and the upper door guide. This method, however, did not solve the problem. The latest approach was to install springs made from strip spring steel stock on the top of each door. Mr. Vitale explained, "By installing two springs on top of each door, the clearance between the top of the spring and the upper door guide was reduced to approximately 1/16 inch. The doors were re-installed by inserting the top of the door into its upper guide, compressing the spring by pushing up on the door, and positioning the door rollers over the roller track. Although our springs worked better than the nylon guide pins, we are still having trouble keeping the doors on the tracks. I think now that part of the problem is caused by the roller brackets which may be flexing under the 50 pound weight of the door." The die and drill jig used to make the springs are described in Exhibit C-1, figure 3. Typical assembly of the cabinet doors is described in greater detail in Exhibit C-2.

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Figure 1. Nurse shown using cabinet.



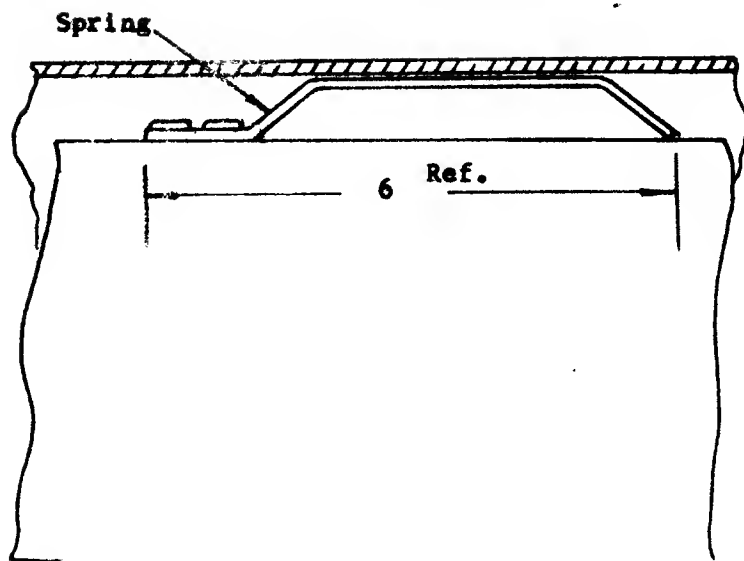
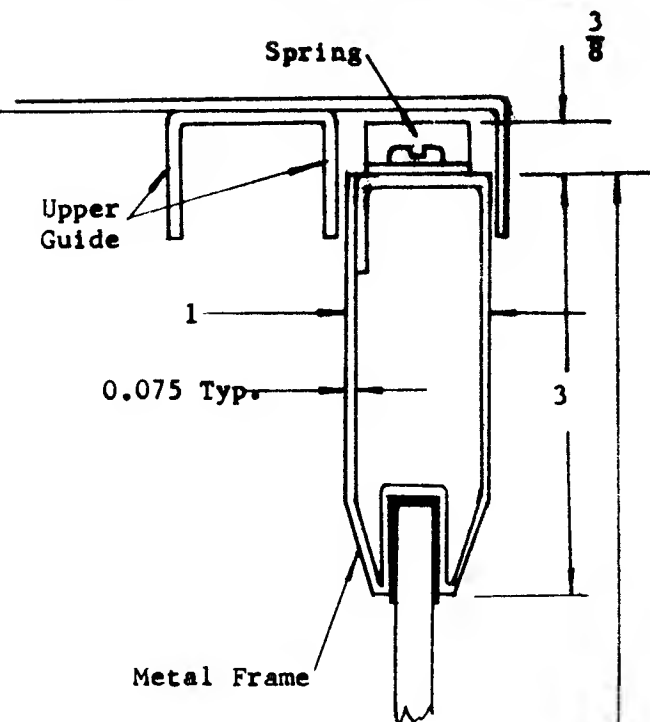
Figure 2. Derailed cabinet door.



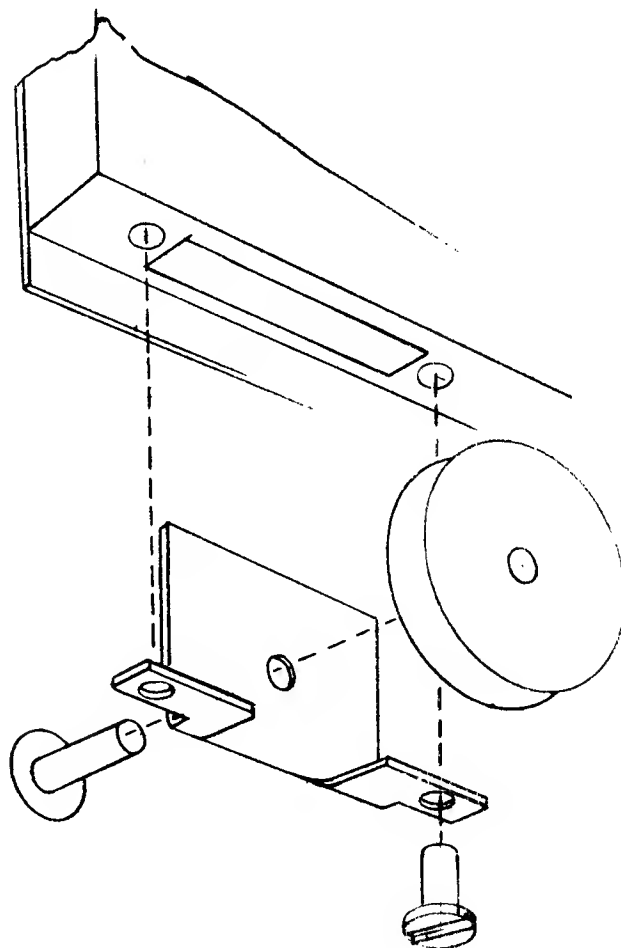
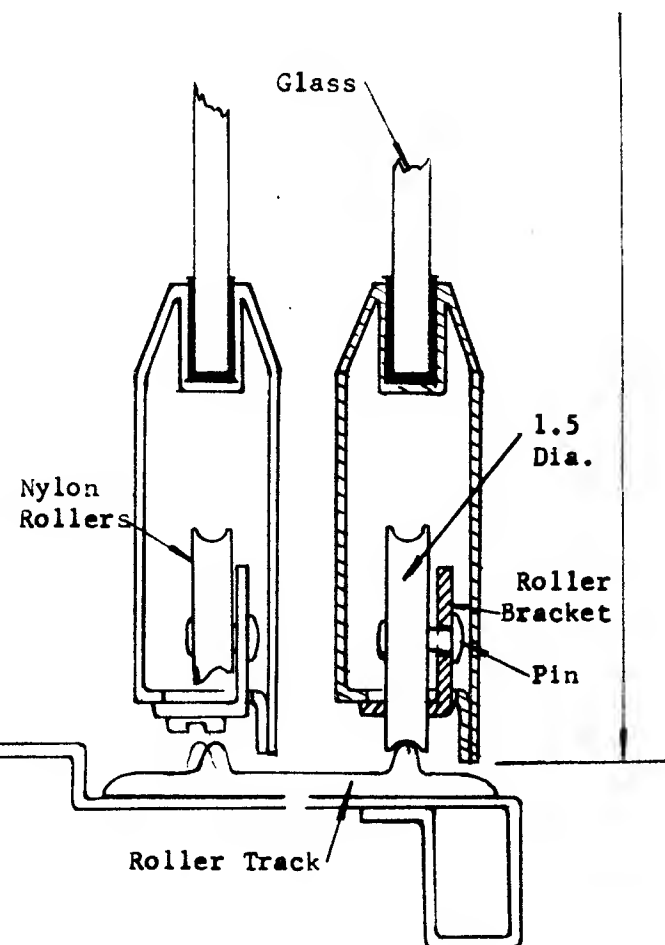
Figure 3. Spring and forming die.

Exhibit C-2. Cabinet Door Assembly

ECL 24
ME 112b-1



3' - 6'



SHORT DESIGN CASES (D)

Label Dispenser Design

In March, 1962, Mr. Hans Goldschmidt, a product designer from Menlo Park, California, was confronted with the problem of designing a dispenser for labels made by the Dennison Manufacturing Company of Framington, Massachusetts. Mr. Goldschmidt was asked to submit sketches for a dispenser while he was visiting Dennison to discuss an idea he had developed for a new teaching aid.

The purpose of the label dispenser was explained to Mr. Goldschmidt at the end of his visit by Mr. Paul Buhl, Assistant Merchandise Manager of Dennison's Resale Products Division. The label dispenser was to be used by retail store clerks who put individual price labels on items for sale. The dispenser had to have a writing surface, a means for holding a roll of labels, and a device for peeling labels off a paper backing tape. Mr. Buhl emphasized that the labeler must not weigh more than 1/2 pound, and that it should be designed to allow the store clerk to put it in his back pocket when not in use.

Shortly after he returned to Menlo Park, Mr. Goldschmidt obtained catalogue literature describing label dispensers already marketed by other companies. Two of these dispensers are described in greater detail in Exhibit D-1. These label dispensers typically used open rolls of 1000 labels each. The roll was supported by a metal dowel which passed through two vertical side plates. The strip of labels passed over a writing surface and through a guide at the end of the dispenser base. The labels were peeled from the backing paper by pulling the paper down sharply over the edge of the dispenser base. The labels, which were stiffer than the backing paper, would curl away from the backing paper and allow the clerk to remove them individually.

Mr. Goldschmidt submitted sketches of six labelers to Dennison shortly after he returned to Menlo Park. These sketches were not available for reprint. On April 4, 1962, Mr. Goldschmidt received a letter from Dennison in reply to his sketches. The letter included additional design requirements. This letter is described in greater detail in Exhibit D-2. In later correspondence with Mr. Goldschmidt, Mr. Buhl forwarded an example of the Dennison logo used on the company's products. Mr. Goldschmidt felt that the label rolls should be boxed. He said, "A brightly colored box with the Dennison name on it would be a good source of advertising for Dennison in that it would remind store buyers of the Dennison name. In addition, the box could also provide an easy way of fixing the roll to the dispenser." The Dennison logo is described in Exhibit D-3.

.....it's the



ABP LABELER

.....for variable price marking

FAST

CLEAN

NEAT

**SPECIAL
OFFER
\$19.75**

No. 29 INCLUDES

- 1 ABP LABELER
- 10 Thousand ABP Labels
Printed with Store Name
- 1 Marking Pen and Holder

TOTAL PRICE **\$19.75**

ADDITIONAL LABELS OR REFILLS
PRICE PER 1000—1000 TO A ROLL

Style	2S	
Size	5/8" x 5/8"	
Paper	White	
Ink	Black	
QUAN	PLAIN	PRINTED
5M	1.50	2.75
10M	1.35	1.50
20M	1.25	1.40
35M	1.15	1.35
50M	1.05	1.20

USEN PRICES, F.O.B. FACTORY

EASY LOADING
HANDY TEAR OFF
MARKING PEN and HOLDER
NO-MAR FEET

Actual Size Label
supplied
5/8" x 5/8"

E & S

CUT RATE

PRESSURE SENSITIVE LABELS
Peel easily from backing strip.
Stick firmly to merchandise
NO MOISTENING REQUIRED

Limit copy due to small space
2 lines maximum

Note: Label shown can also be used interchangeably
in the ABP Automatic Printer—Ask your salesman.

Distributed By:

ABP Div.
Automatic Salesbook Co.,
Middletown, Conn.

Increase Sales

WITH PROPER PRICE MARKING

USE THE ABP PRINTER

MODEL 101

Price marks pressure sensitive labels
as fast as you push down the handle

EXCLUSIVE FEATURES!

1. Self-inking pricer INSTANTLY slides off base for marking merchandise direct.
2. One Model handles wide variety of label styles and sizes — up to 1 1/4" sq.
3. Quick Label change with snap-on type cartridge.
4. Just rotate bands to change price.

Slides off base
for direct pricing

COMPLETE — ONLY

with 1000 plain labels
and bottle marking ink **\$2995**

SPECIFY LABEL SIZE

or use the
ABP PRICE MARKING KIT
For Direct Price Marking

No. 59 COMPLETE KIT INCLUDES

1. Super Market proven self-inking pricer.
2. 1 1/4 oz. bottle ABP Marking ink.
3. 1 1/4 oz. bottle ABP Ink Remover.

Complete **\$950**

Popular 5 band number style supplied

Distributed By:



Pressure Sensitive Labels peel easily off backing strip, stick firmly to merchandise.

Your Store Name or other information printed on every label at small cost.

PRINTED PRESSURE SENSITIVE LABELS FOR ABP PRINTER SEE ILLUSTRATION ABOVE USER PRICES, F.O.B. FACTORY

Paper	White	White	Yellow
Ink	Black	Black	Red
Style	2S	1 S (Not Illus.)	1 SR
Size	5/8" x 5/8"	3/4" x 1"	3/4" x 1"

QUAN.	PLAIN	PRINTED	PLAIN	PRINTED	PRINTED SALE
5M	1.50	4.75	1.75	2.95	1.90
10M	1.35	1.50	1.40	1.95	1.70
20M	1.25	1.39	1.39	1.75	1.65
30M	1.15	1.30	1.30	1.65	1.55
50M	1.05	1.20	1.25	1.50	1.40
100M	1.00	1.15	1.15	1.25	1.20

SEE PRICES ATTACHED

PRICE PER 1000 — 1000 TO A ROLL

Style 15S and other sizes and styles — Prices on Request

PRICE PER 1000 — 1000 TO A ROLL

Style 15S and other sizes and styles — Prices on Request



MANUFACTURING COMPANY
FRAMINGHAM, MASSACHUSETTS

April 4, 1962

Mr. H. Goldschmidt,
H. Goldschmidt Associates, Inc.,
1274 El Camino Real,
Menlo Park, Calif.

Dear Mr. Goldschmidt:

We were very favorably impressed with your initial sketches of the label dispenser. We would like to discuss them with you in greater detail when you come to Framingham.

Without referring to your letter, we consider sketches E and F the best for our purposes; we felt E might be more practical because the item to sell in volume must be inexpensive and E is a one-piece mold as opposed to F, which is apparently a two-piece mold. We felt that for ultimate utility, the dispenser should be designed to fit comfortably in the hand when in use. From the sketch it was difficult to ascertain whether E had this feature; if it doesn't, perhaps we should consider a tapered area for the hand or a thumbhole, similar to those on some of the other sketches.

We were also impressed with sketch B; however, we feel that this is a design for the future. The basic idea might be changed from a dispenser for price labels to an item called a "desk secretary", to dispense air mail labels, special delivery labels, gummed reinforcements, and correction tape. If our initial dispenser is successful, we would be interested in expanding the item into something like sketch B.

We have some reservations about a dispenser where the backing sheet lays on its side or twists. Because of this, we discounted sketches A and D; however, we did think sketch D is a particularly interesting design. We did not feel that sketch C afforded a suitable writing surface for the intended use in this application.

In answer to some of the questions raised in your March 29 letter: We feel that dispensers which twist the tape might not be satisfactory, particularly if the trend continues toward a label with an easier release.

Page 2 - H. Goldschmidt Associates, Inc.:

4/4/62

We would prefer to be able to use various label widths on the same dispenser; however, initially we would probably start with one label size of 3/4" x 5/8". This would make the tape width about 11/16". The basic packaging would be 1000 labels per roll, which on a 1" core would make the roll approximately 3 1/2" in diameter.

We feel that portability is an important factor and that these dispensers will be used principally in the storeroom, as well as on the sales floor.

Regarding the price of the unit: Your guess is quite accurate at below \$20.00. Competitive items now on the market sell for about \$20.00 with 10 M printed labels. To be competitive with plain or stock labels, we would probably have to be somewhat below the \$20.00 figure.

We don't feel that the marking pen will have to be provided; however, a holder for a pen would be a plus feature.

As explained above, we feel that a multiple unit similar to B does make sense in a different application, such as a desk secretary.

We think it quite conceivable that an operator might want to tear the strip of label roll from the dispenser and carry it to the marking job.

We are in complete agreement with you that a printing device on a dispenser of this type would be out of place; we feel that this is a completely different item for a completely different price range.

We were very pleased with your feel of this problem for a small dispenser to be used in retail stores, and shall look forward to discussing this with you in greater detail when you visit Framingham.

Yours cordially,

DENNISON MANUFACTURING CO.



Asst. Merchandise Manager,
Resale Products Division.

P.R.Buhl-K

Dennison MFG. CO.
FRAMINGHAM, MASS. U.S.A.

LOGO for DENNISON LABEL
DISPENSER.

SCALE: FULL

DATE: 24 JAN 1963

H. GOLDSCHMIDT & ASSOC. INC.
1274 EL CAMINO REAL
MENLO PARK, CALIF.